

# AG P LE Series

## Low Energy Brackish Water RO Elements (Replaces B085 LE 4040, B400 LE ASD, and B440 LE)

The AG P LE-Series thin-film reverse osmosis (RO) membrane is characterized by a balance of high water permeability, low energy, and high rejection. This combination makes these elements ideal for applications where low energy demand is a stronger factor than very high rejection, and flux must be controlled to maintain long element lifetime. This could include many applications such as those using a surface water feed source, those without ultrafiltration pretreatment, and seasonally variant or cold-water sources that will experience naturally lower flux. The AG P LE family of brackish water elements also offers very high rejection of uncharged and lightly charged species including silica and many micropollutants. These high-performance features are the result of SUEZ's highly cross-linked polyamide thin film layer with low surface zeta potential that can also withstand multiple cleanings and maintain differentiated performance for the life of the element.

The ASD (alternating strand design) feed spacer technology offers an improvement in RO lifetime cost performance by lower pressure drop and reduced fouling tendency.

AG P LE series is certified to NSF 61.

**Table 1a: Element Specification**

| Membrane | AG P LE-series, thin-film membrane (TFM*) |  |  |
|----------|---|--|--|
|----------|---|--|--|

| Model                 | Average permeate flow gpd (m <sup>3</sup> /day) (1)(2) | Average NaCl rejection (1)(2) | Minimum NaCl rejection (1)(2) |
|-----------------------|--|-------------------------------|-------------------------------|
| AG-85 P LE            | 2,000 (7.4)  | 99.5%                         | 99.0%                         |
| AG-400 P LE, 34 (ASD) | 9,600 (36.2)   | 99.5%                         | 99.0%                         |
| AG-440 P LE           | 10,100 (38.3)  | 99.5%                         | 99.0%                         |

(1) Average salt rejection after 24 hours of operation. Individual flow rate may vary with a minimum of 1,550 gpd (5.9 m<sup>3</sup>/d) for the AG-85 P LE, 7,600 gpd (28.9 m<sup>3</sup>/d) for the AG-400 P LE, 34 (ASD), and 8,100 gpd (30.6 m<sup>3</sup>/d) for the AG-440 P LE.

(2) Testing conditions: 2000ppm NaCl solution at 150psi (1,034kPa) operating pressure, 77°F (25°C), pH7 and 15% recovery.

| Model                 | Active area ft <sup>2</sup> (m <sup>2</sup> ) | Outer wrap | Feed spacer mil | Part number |
|-----------------------|---|------------|-----------------|-------------|
| AG-85 P LE            | 85 (7.9)                                      | Fiberglass | 34              | 3185601     |
| AG-400 P LE, 34 (ASD) | 400 (37.2)                                    | Fiberglass | 34 (ASD)        | 3185611     |
| AG-440 P LE           | 440 (40.9)                                    | Fiberglass | 28              | 3185596     |

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**Table 1b: Typical rejection of other species**

| Nitrate, NO <sub>3</sub> <sup>-</sup><br>(1)(3) | Silica, SiO <sub>2</sub><br>(1)(3) | Isopropyl Alcohol (IPA)<br>(2)(3) | Boron, B<br>(1)(3) |
|---|------------------------------------|-----------------------------------|--------------------|
| 97.0%   | 99.5%                              | 92.0%                             | 69.0%              |

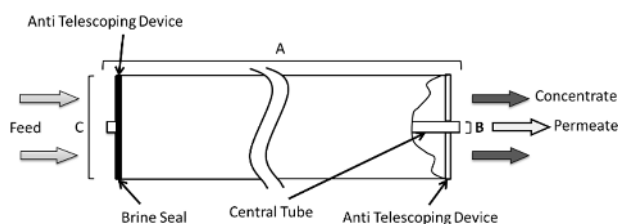
(1) Typical rejection performance for specific ions based on the above test condition plus 100 mg/L NO<sub>3</sub><sup>-</sup>, 50 mg/L SiO<sub>2</sub>, or 5 mg/L B respectively.

(2) Isopropyl alcohol testing is at 100 mg/L IPA without NaCl.

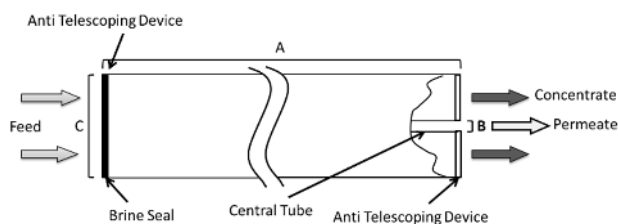
(3) These items are provided as general information only. They are approximate values and are not considered part of the product specifications.

**Table 2: Dimensions and Weights**

| Model                 | Type   | Dimensions, inches<br>(cm) |                 |               | Boxed Weight<br>lbs (kg) |
|-----------------------|--------|----------------------------|-----------------|---------------|--------------------------|
|                       |        | A                          | B               | C             |                          |
| AG-85 P LE            | Male   | 40.0<br>(101.6)            | 0.75<br>(1.90)  | 3.9<br>(10.0) | 12 (5.5)                 |
| AG-400 P LE, 34 [ASD] | Female | 40.0<br>(101.6)            | 1.125<br>(2.86) | 7.9<br>(20.1) | 40 (18)                  |
| AG-440 P LE           | Female | 40.0<br>(101.6)            | 1.125<br>(2.86) | 7.9<br>(20.1) | 42 (19)                  |



**Figure 1a: Element Dimensions Diagram – Male**



**Figure 1b: Element Dimensions Diagram - Female**

**Table 3: Operating and CIP parameters**

|                            |  |
|----------------------------|--|
| Typical Operating Pressure | 150 psi (830 kPa)  |
| Typical Operating Flux     | 10-20GFD (15-35LMH)  |
| Maximum Operating Pressure | 600 psi (4,137 kPa)  |
| Maximum Temperature        | Operation: 113°F (45°C)  |
| pH range                   | Continuous operation 2.0 – 11.0<br>Clean-In-Place (CIP): 1.0-12.0  |
| Maximum Pressure Drop      | Over an element: 15 psi (103 kPa)<br>Per housing: 50 psi (345 kPa) |
| Chlorine Tolerance         | 0.1 ppm maximum  |
| Feedwater                  | NTU < 1<br>SDI <sub>15</sub> < 5                                   |

## Additional Information

- As with any product, use of the products mentioned in this publication in a given application must be tested (including field testing, etc.) by the user in advance to determine suitability.
- Treat RO elements with care; do not drop the element.
- Each RO element is wet tested, preserved in a 1% weight sodium bisulfite solution, and vacuum packed in oxygen barrier bags.
- During storage, avoid freezing and direct sunlight. The temperature should be below 35°C (95°F).

## After Installation

- Keep the RO elements wet and use a compatible preservative for storage duration longer than 7 days.
- During the initial start-up, discharge the first permeate to drain for 30 minutes.
- Permeate back pressure should not exceed feed pressure at any time.
- The RO elements shall be maintained in a clean condition, unfouled by particulate matter or precipitates or biological growth.
- Consider cleaning, if the pressure drop increases by 20% or water permeability decreases by 10%. Use only chemicals which are compatible with the membrane.